

PATENT ABSTRACTS OF JAPAN

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(54) PLASMA DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To miniaturize a plasma display(PDP) device, and improve the operability of a touch panel, and further, provide a PDP device with electromagnetic interference(EMI) countermeasures applied thereto, by integrating the touch panel into the PDP device.

SOLUTION: A touch panel 3 is stored in the upper case 1 of a plasma display(PDP) device with electromagnetic interference(EMI) shield countermeasures, and the touch panel 3 is fastened by metal fittings 8 provided in a shield case 7 where to the EMI shield countermeasures are applied. Also, to a lower case 2 of the PDP device, EPI shield countermeasures are applied, and on the sides of the touch panel 3 and PDP device, the EPI shield countermeasures are applied thereto by the shield case 7 and shield fingers 9. Further, a power supply cable 10 for the touch panel 3 is routed between the outside of the shield case 7 and the upper case 1 to apply a noise countermeasure thereto. Also, the shield case 7 serves to keep the distance between the touch panel 3 and a display panel 5 constant.



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PRIOR ART

[Description of the Prior Art] The touch panel mounted in the panel of a graphic display method called a plasma display panel (PDP:plasma display panel) changes the display screen, changes an alphabetic character, or is used for retrieval of guidance etc. And although the conventional touch panel had optical, an ultrasonic sensing method, etc., it was used by the appearance by which all were laid in the display. Drawing 11 - drawing 13 show the mounting structure of the touch panel of conventional plasma display equipment (henceforth PDP equipment). Among drawing, the touch panel case in which 41 contained the touch panel 42, and 42a are touch panel sides, detect a location by light or the supersonic wave, and control the contents in the display screen. 43 is a controller for touch panels and is connected to the touch panel 42 by the interconnection cable 44. 45 is the case of PDP equipment, 46 is the display panel of PDP equipment, and it becomes the display screen with a personal computer etc. It is the connectors by which fixed metallic ornaments for 47 to fix the touch panel case 41 and the case 45 of PDP equipment and 48 were prepared in the power cable by the side of PDP equipment, and 49 was prepared in the case of PDP equipment, and is for connecting a personal computer, video, etc. In addition, a is a thickness dimension by the side of a touch panel, and b is a thickness dimension by the side of PDP equipment.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since this invention is constituted as mentioned above, the following effectiveness is done so.
[0035] While being able to attain the whole miniaturization by having taken the measures against EMI shielding against the bottom case on PDP equipment, having prepared the touch panel in the upper case, having carried out EMI shielding of a touch panel side and the PDP equipment side with the shielding case, and having formed the fixed metallic ornaments which fix a touch panel to a shielding case, the attachment operability of a touch panel is good and the PDP equipment with which the cure against EMI and the measures against EMS were moreover taken can be obtained.

[0036] Moreover, since the touch panel is fixed to a shielding case by bending a pawl-like projection, the attachment operability of a touch panel becomes much more good.

[0037] Moreover, by keeping constant the distance between a touch panel and the display panel of PDP equipment, the operability of a touch panel becomes good and making other touch items malfunction is lost.

[0038] Moreover, the temperature rise of the space between a touch panel and the display panel of PDP equipment can be suppressed by having prepared the ventilating hole in the shielding case.

[0039] Moreover, noise preventive measures can be given by letting the power cable of a touch panel pass between an upper case and a shielding case.

[0040] Moreover, shielding with the exterior can be made into a positive thing by making the controller for touch panels into 3-fold shielding structure.

[0041] Moreover, since the clearance for making the front face of an ultrasonic type touch panel pass a supersonic wave is secured, actuation of a touch panel can be made into a positive thing.

[0042] Moreover, there is an advantage that it is not necessary to give an impact strong against the clip section with software shielding or contact finger shielding which grounds the circuit board with flexibility since the case is grounded.

[0043] Moreover, since the injection condition of the controller power source by the side of a touch panel is displayed with the annunciator, an operator can check easily by vision.

[0044] Since it is considering as the wiring clamp of the power cable for touch panels using the fixed means of a vertical case, cable immobilization is easy and, moreover, consideration can also be paid to the cure against a noise of a cable.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the top view showing the mounting structure of the touch panel of the PDP equipment which is the gestalt 1 of implementation of this invention.

[Drawing 2] It is the sectional view showing the mounting structure of the touch panel of the PDP equipment which is the gestalt 1 of implementation of this invention.

[Drawing 3] It is the fragmentary sectional view showing the important section structure of the gestalt 1 of implementation of this invention.

[Drawing 4] It is the sectional view and side elevation of a shielding case in the gestalt 1 of implementation of this invention.

[Drawing 5] the shielding structure of the controller for touch panels of the PDP equipment which is the gestalt 2 of implementation of this invention is shown -- it is a fracture Fig. a part.

[Drawing 6] It is the fragmentary sectional view of the principal part showing the mounting structure of the touch panel of the PDP equipment which is the gestalt 3 of implementation of this invention.

[Drawing 7] It is the rear-face Fig. and fragmentary sectional view of the principal part showing the fixed structure of the power cable for touch panels of the PDP equipment which is the gestalt 5 of implementation of this invention.

[Drawing 8] It is the sectional view showing the noise cure structure of the PDP equipment which is the gestalt 6 of implementation of this invention.

[Drawing 9] It is the partial side elevation showing the controller power-on default screen structure by the side of the touch panel of the PDP equipment which is the gestalt 7 of implementation of this invention.

[Drawing 10] It is the part plan showing the structure of the connector for power-source connection which connects the PDP equipment which is the gestalt 8 of implementation of this invention, and a PDP power source.

[Drawing 11] It is the top view showing the mounting structure of the touch panel of conventional PDP equipment.

[Drawing 12] It is the side elevation showing the mounting structure of the touch panel of conventional PDP equipment.

[Drawing 13] It is the sectional view showing the mounting structure of the touch panel of conventional PDP equipment.

[Description of Notations]

1 Upper Case, 2 Bottom Case, 3 Touch Panel, 4 Source of Ultrasonic Oscillation, 5 A display panel, 6 A printed circuit board, 7 A shielding case, 8 Fixed metallic ornaments (pawl-like projection), 9 A shielding finger, 10 The power cable for touch panels, 11 A ventilating hole, 12 The clip for connection, 13 Contact finger, 14 A clearance, 15 shielding box, 16 The controller for touch panels, 17 The shielding box for controllers, 18 The cable for controllers, 19 A clearance, 20 A projection, 21 The **** seat for case immobilization, **** for 22 case immobilization, 23 Software shielding, 24 A support plate, 25 Contact finger shielding, 26 The PDP side connector, 27 A touch panel side connector, 28 An indicating lamp (ELD lamp), 29 A dashboard, 30 A PDP power source, 31 A power cable, 32 JR connector, 33 A cap nut, 34 Special screw.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the mounting structure for mounting a touch panel in plasma display equipment.

[0002]

[Description of the Prior Art] The touch panel mounted in the panel of a graphic display method called a plasma display panel (PDP: plasma display panel) changes the display screen, changes an alphabetic character, or is used for retrieval of guidance etc. And although the conventional touch panel had optical, an ultrasonic sensing method, etc., it was used by the appearance by which all were laid in the display. Drawing 11 - drawing 13 show the mounting structure of the touch panel of conventional plasma display equipment (henceforth PDP equipment). Among drawing, the touch panel case in which 41 contained the touch panel 42, and 42a are touch panel sides, detect a location by light or the supersonic wave, and control the contents in the display screen. 43 is a controller for touch panels and is connected to the touch panel 42 by the interconnection cable 44. 45 is the case of PDP equipment, 46 is the display panel of PDP equipment, and it becomes the display screen with a personal computer etc. It is the connectors by which fixed metallic ornaments for 47 to fix the touch panel case 41 and the case 45 of PDP equipment and 48 were prepared in the power cable by the side of PDP equipment, and 49 was prepared in the case of PDP equipment, and is for connecting a personal computer, video, etc. In addition, a is a thickness dimension by the side of a touch panel, and b is a thickness dimension by the side of PDP equipment.

[0003]

[Problem(s) to be Solved by the Invention] Since laid in PDP equipment, and it attached or the touch panels of the above conventional PDP equipments were attached combining special make articles even if they were any of optical or an ultrasonic sensing method, the whole configuration became large, and since a power source was also separate, weight was also heavy. Moreover, since the screen of PDP equipment and the actuation side of a touch panel were separated, it separated from the item to touch and there was a problem that operating other touch items etc. had bad operability. Furthermore, by part for the connector area for power-cable connection, there was constraint of there being it not being the structure which can be taken out and inserted simply, and the need of giving special covering again. Moreover, the cure against EMI (electromagnetic interference) and the cure against EMS (electromagnetic smog) were required for PDP equipment and a touch panel.

[0004] In addition, as conventional advanced technology, although there were JP,6-230873,A, JP,8-76922,A, etc., all these were the things of the structure which combined the liquid crystal display panel and the touch panel with one, and since they were PDP equipment, they were those against which neither the cure against EMI nor the measures against EMS is taken.

[0005] By having been made in order to solve the above technical problems, and incorporating a touch panel and the controller for touch panels in PDP equipment, this invention improves operability of a touch panel while attaining a miniaturization, and it obtains the PDP equipment with which the cure against EMI and the measures against EMS were taken further.

[0006]

[Means for Solving the Problem] The plasma display equipment concerning this invention is formed in the circuit board of the upper case where the measures against EMI shielding were taken, respectively and a bottom case, the

touch panel prepared in the upper case, the display panel of PDP equipment prepared in both cases, and PDP equipment, the shielding case which is established in both cases and carries out EMI shielding of a touch panel side and the PDP equipment side, and this shielding case, and is equipped with the fixed metallic ornaments which fix a touch panel.

[0007] Moreover, fixed metallic ornaments are considered as the projection of the shape of a pawl prepared in the shielding case. [two or more]

[0008] Moreover, a shielding case keeps constant the distance between a touch panel and the display panel of PDP equipment.

[0009] Moreover, a shielding case has a ventilating hole for preventing the temperature rise of the space between a touch panel and the display panel of PDP equipment.

[0010] Moreover, noise preventive measures are given by letting the power cable of a touch panel pass between an upper case and a shielding case.

[0011] It has the shielding box for controllers which holds the controller for touch panels held in the shielding case of dedication, and this controller for touch panels further again, and carries out EMI shielding further.

[0012] Moreover, it has the ultrasonic type touch panel which established the source of an ultrasonic oscillation in the periphery edge, and the clearance for passing a supersonic wave is formed between an upper case and a touch panel.

[0013] Moreover, two or more projections are prepared in the opening edge rear face of an upper case, and a clearance is formed.

[0014] Moreover, the projection which consists of the quality of the material which lets two or more glass projections or a supersonic wave pass is prepared in the periphery section front face of a touch panel, and a clearance is formed.

[0015] It is prepared between the circuit board and a bottom case, and has software shielding which grounds the circuit board with flexibility further again.

[0016] Moreover, it replaces with software shielding and contact finger shielding is used.

[0017] The PDP equipment side connector prepared in the skin within both cases and a touch panel side connector, and this touch panel side connector are approached further again, and it is prepared, and has the annunciator which displays the injection condition of the controller power source by the side of a touch panel.

[0018] The **** seat for case immobilization which it was prepared in the corner of an upper case, and the clearance formed between upper cases was made to agree with the power cable for touch panels in the path of the power cable for touch panels, and served as the duty of a wiring clamp further again, It has **** for case immobilization which a point is thrust into this **** seat for case immobilization, and fixes both cases, and the power cable for touch panels is arranged in the clearance between an upper case and the **** seat for case immobilization.

[0019]

[Embodiment of the Invention]

Gestalt 1. drawing 1 of operation - drawing 4 show the mounting structure of the touch panel of the PDP equipment which is the gestalt 1 of implementation of this invention. In drawing, 1 is the upper case of PDP equipment, 2 is a bottom case of PDP equipment, and, as for the bottom case, the measures against EMI shielding are taken the top. It is the sensor section of the touch panel 3 which consists of a source of an ultrasonic oscillation where the touch panel and 3a which prepared 3 in the upper case 1 were prepared in the touch panel side, and 4 was prepared on the periphery edge of a touch panel 3, and is covered with the insulating material. The flexible printed circuit board in which, as for 5, the display panel of PDP equipment was attached in, and, as for 6, the passive circuit elements for a drive by the side of PDP equipment etc. were attached, and 7 are the shielding cases for carrying out EMI shielding of a touch panel side and the PDP equipment side, and they are serving to keep constant the distance between a touch panel 3 and the display panel 5 of PDP equipment while they serve as the object for immobilization of a touch panel 3. 8 is fixed metallic ornaments which consist of a projection of the shape of a pawl prepared in the shielding case 7, bends a touch panel 3 in several perimeters, and is fixed. 9 is a shielding finger for carrying out EMI shielding of a touch panel side and the PDP equipment side, and is prepared between the shielding case 7 and the bottom case 2. 10 is a power cable for touch panels, this cable is taken about between the upper case 2 and the shielding case 7, and the cure against a noise is also taken into consideration. 11 is the ventilating hole prepared in the shielding case 7, and has prevented the temperature rise of the space between a touch panel 3 and the display panel 5 of PDP equipment. 12 is the predetermined clearance prepared so that a contact finger might not stick the clip for connection of a flexible printed circuit board 6, and 13 and the upper case 1 and a touch panel 3 might not stick 14, and becomes the path of the supersonic wave oscillated from

the source 4 of an ultrasonic oscillation.

[0020] Thus, in the mounting structure of the touch panel of the constituted PDP equipment, a touch panel 3 is contained in the upper case 1 of PDP equipment where the measures against EMI shielding were taken, and the touch panel 3 of a parenthesis is fixed by the fixed metallic ornaments 8 formed in the shielding case 7 with which the measures against EMI shielding were taken. Moreover, the measures against EMI shielding are taken and, in a shielding case 7 and the shielding finger 9, the measures against EMI shielding are taken also for the bottom case 2 of PDP equipment by the touch panel and PDP equipment side. Furthermore, the power cable 10 for touch panels is taken about between the outside of a shielding case 7, and the upper case 1, and the measures against a noise are taken. Moreover, a shielding case 7 is in the condition which fixed the touch panel 3 by the fixed metallic ornaments 8, and serves to hold uniformly the distance between a touch panel 3 and a display panel 5. The temperature rise of the space of a touch panel 3 and a display panel 5 is controlled by the ventilating hole 11 prepared in the shielding case 7 further again.

[0021] Gestalt 2. drawing 5 of operation shows the shielding structure of the controller for touch panels of the PDP equipment which is the gestalt 2 of implementation of this invention. In drawing, 1 is the upper case of PDP equipment, 2 is a bottom case of PDP equipment, and it is the same structure as the gestalt 1 of operation. The shielding box whose 15 is a part of circuit board of PDP equipment and which is carrying out EMI shielding of the video interface section, for example, and 16 are the controllers for touch panels, it is dedicated to the shielding case of dedication and the measures against EMI shielding are taken also for this simple substance. The shielding box for controllers which 17 holds the above-mentioned controller 16 for touch panels, and carries out EMI shielding further, and 18 are the cables of the controller 16 for touch panels.

[0022] According to the configuration of the gestalt 2 of this operation, the controller 16 for touch panels has three-fold shielding structure in the bottom cases 1 and 2 the shielding case of dedication, the shielding box 17 for controllers, and the top in order to lessen effect of EMI and EMS.

[0023] Gestalt 3. drawing 6 of operation shows the mounting structure of the touch panel of the PDP equipment which is the gestalt 3 of implementation of this invention. In drawing, 1 is the upper case of PDP equipment and two or more projections 20 for forming the clearance 19 which make the supersonic wave of a touch panel easy to pass between touch panels 3 are mostly formed in the opening edge rear face at equal intervals. The source of an ultrasonic oscillation which prepared 4 in the rim periphery of a touch panel 3, and 11 are the ventilating holes prepared in the shielding case 7, and are a thing for heat dissipation by the side of the inside of a touch panel 3.

[0024] According to the configuration of the gestalt 3 of this operation, the path of the supersonic wave of touch panel 3 front face is fully securable with two or more projections 20 prepared in the upper case 1.

[0025] In the gestalt 3 of the gestalt 4. above-mentioned implementation of operation, although the projection 20 was formed in the upper case 1 side, with the gestalt 4 of this operation, the clearance for passing a supersonic wave is formed by preparing the projection which consists of the quality of the material which lets two or more glass projections or a supersonic wave pass in the periphery section front face of a touch panel 3.

[0026] Gestalt 5. drawing 7 of operation shows the fixed structure of the power cable for touch panels of the PDP equipment which is the gestalt 5 of implementation of this invention. 21 is the **** seat for case immobilization prepared in the four corners of the upper case 1, and is making it serve also as the duty of a wiring clamp in drawing by making the clearance between the upper cases 1 agree in the path of the power cable 10 for touch panels. 22 is **** for case immobilization for fixing the upper case 1 and the bottom case 2, and the upper case 1 and the bottom case 2 are fixed by thrusting a point into the **** seat 22 for case immobilization. Moreover, the power cable 10 for touch panels is letting the inside of a shielding case 7, and the top and the bottom cases 1 and 2 pass in consideration of the cure against a noise.

[0027] According to the configuration of the gestalt 5 of this operation, the fixed means of the bottom cases 1 and 2 serves as the wiring clamp of the power cable 10 for touch panels the top, and, as for the power cable 10 for touch panels, consideration of the cure against a noise is paid in the bottom cases 1 and 2 the shielding case 7 and the top.

[0028] Gestalt 6. drawing 8 of operation shows the noise cure structure of the PDP equipment which is the gestalt 6 of implementation of this invention. In drawing, the clip for connection with which 12 was prepared in the edge of a flexible printed circuit board 6, and 23 are software shielding for grounding this clip 12 and the support plate 24 which served as the touch-down to the bottom case 2 with flexibility reasonable, for example, are good to use 01-0901-6605 made from Solar Wire gauze. 25 is contact finger shielding made from the beryllium copper for grounding certainly a

clip 12 and the support plate 24 which served as the earth plate to the bottom case 2 with flexibility, for example, is good to use Kitagawa Ironworker's type -98-500-02. In addition, the above-mentioned software shielding 23 and the contact finger shielding 25 are used for the same purpose, by drawing 8, divide two kinds of touch-down approaches into right and left, and show them.

[0029] According to the configuration of the gestalt 6 of this operation, the printed circuit board of PDP equipment and other noise generation sources can be certainly grounded in a bottom case. Moreover, it can ground at a soft feel without giving an impact strong against the clip 12 section.

[0030] Gestalt 7. drawing 9 of operation shows the controller power-on default screen structure by the side of the touch panel of the PDP equipment which is the gestalt 7 of implementation of this invention. In drawing, 26 is the indicating lamp which consists of an ELD lamp which the connector by the side of PDP equipment and 27 approached the connector by the side of a touch panel, and 28 approached the touch panel side connector 27, and was formed, and it indicates that the controller power source by the side of a touch panel is in ON condition. 29 is a dashboard with which the touch panel side connector 27 and the PDP side connector 26 are divided.

[0031] According to the gestalt 7 of this operation, the injection condition of the controller power source by the side of a touch panel can be easily known with the ELD lamp 28 formed by approaching the touch panel side connector 27.

[0032] Gestalt 8. drawing 10 of operation shows the structure of the connector for power-source connection which connects a PDP power source with the PDP equipment which is the gestalt 8 of implementation of this invention. In drawing, the power cable of PDP equipment and 32 are the special screws of the structure where, as for JR connector and 33, the cap nut for attachment and detachment of a connector 32 does not loosen, and, as for 34, this cap nut 33 does not loosen, for example, as for 30, a PDP power source and 31 are good at LR tamper roof ****, TORUKUSU ****, etc. A special tool is required for the cap nut 33 of a connector connected once to have structure from which it does not escape easily by the common tool, and loosen by this special screw 34.

[0033] According to the gestalt 8 of this operation, the connector which connects a PDP power source with PDP equipment can be made into the structure which cannot be detached and attached easily.

[0034]

[Effect of the Invention] Since this invention is constituted as mentioned above, the following effectiveness is done so.

[0035] While being able to attain the whole miniaturization by having taken the measures against EMI shielding against the bottom case on PDP equipment, having prepared the touch panel in the upper case, having carried out EMI shielding of a touch panel side and the PDP equipment side with the shielding case, and having formed the fixed metallic ornaments which fix a touch panel to a shielding case, the attachment operability of a touch panel is good and the PDP equipment with which the cure against EMI and the measures against EMS were moreover taken can be obtained.

[0036] Moreover, since the touch panel is fixed to a shielding case by bending a pawl-like projection, the attachment operability of a touch panel becomes much more good.

[0037] Moreover, by keeping constant the distance between a touch panel and the display panel of PDP equipment, the operability of a touch panel becomes good and making other touch items malfunction is lost.

[0038] Moreover, the temperature rise of the space between a touch panel and the display panel of PDP equipment can be suppressed by having prepared the ventilating hole in the shielding case.

[0039] Moreover, noise preventive measures can be given by letting the power cable of a touch panel pass between an upper case and a shielding case.

[0040] Moreover, shielding with the exterior can be made into a positive thing by making the controller for touch panels into 3-fold shielding structure.

[0041] Moreover, since the clearance for making the front face of an ultrasonic type touch panel pass a supersonic wave is secured, actuation of a touch panel can be made into a positive thing.

[0042] Moreover, there is an advantage that it is not necessary to give an impact strong against the clip section with software shielding or contact finger shielding which grounds the circuit board with flexibility since the case is grounded.

[0043] Moreover, since the injection condition of the controller power source by the side of a touch panel is displayed with the annunciator, an operator can check easily by vision.

[0044] Since it is considering as the wiring clamp of the power cable for touch panels using the fixed means of a vertical case, cable immobilization is easy and, moreover, consideration can also be paid to the cure against a noise of a

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CLAIMS

[Claim(s)]

[Claim 1] The upper case where the measures against EMI (electromagnetic interference) shielding were taken, respectively, and a bottom case, The touch panel prepared in the above top case, the display panel of the PDP (plasma display panel) equipment formed in both the above-mentioned cases, and the circuit board of PDP equipment, Plasma display equipment characterized by having the fixed metallic ornaments which are formed in both the above-mentioned cases, are formed in the shielding case which carries out EMI shielding of the above-mentioned touch panel side and the above-mentioned PDP equipment side, and this shielding case, and fix the above-mentioned touch panel.

[Claim 2] Fixed metallic ornaments are plasma display equipment according to claim 1 which is the projection of the shape of a pawl prepared in the shielding case, and is characterized by being bent and fixing a touch panel. [two or more]

[Claim 3] A shielding case is plasma display equipment according to claim 1 characterized by being what keeps constant the distance between a touch panel and the display panel of PDP equipment.

[Claim 4] A shielding case is plasma display equipment according to claim 1 or 3 characterized by having a ventilating hole for preventing the temperature rise of the space between a touch panel and the display panel of PDP equipment.

[Claim 5] Plasma display equipment according to claim 1 characterized by giving noise preventive measures by letting the power cable of a touch panel pass between an upper case and a shielding case.

[Claim 6] The plasma display equipment characterized by to have the shielding box for controllers which the cure against EMI shielding holds the upper case given, respectively and a bottom case, the touch panel prepared in the above top case, the controller for touch panels held in the shielding case of dedication, and this controller for touch panels, and carries out EMI shielding further, and the circuit board of the display panel of the PDP equipment with which it was prepared in both the above-mentioned cases, and PDP equipment.

[Claim 7] The plasma display equipment characterized by to have had the circuit board of the upper case where the measures against EMI shielding were taken, respectively and a bottom case, the ultrasonic type touch panel that was prepared in the above top case and established the source of an ultrasonic oscillation in the periphery edge, the display panel of PDP equipment which were prepared in both the above-mentioned cases, and PDP equipment, and to form the clearance for passing a supersonic wave between an above top case and the above-mentioned touch panel.

[Claim 8] Plasma display equipment according to claim 7 characterized by forming a clearance by two or more projections prepared in the opening edge rear face of an upper case.

[Claim 9] Plasma display equipment according to claim 7 characterized by forming a clearance by the projection which consists of the quality of the material which lets two or more glass projections or the supersonic wave formed in the periphery section front face of a touch panel pass.

[Claim 10] The plasma display equipment characterized by to have software shielding which the cure against EMI shielding is established [shielding] between the circuit board of the upper case given, respectively and a bottom case, the touch panel prepared in the above top case, the display panel of PDP equipment prepared in both the above-mentioned cases, and PDP equipment, and the above-mentioned circuit board and the bottom case of the above, and grounds the circuit board with flexibility.

[Claim 11] Plasma display equipment according to claim 10 characterized by having replaced with software shielding and using contact finger shielding.

[Claim 12] The upper case where the measures against EMI shielding were taken, respectively, and a bottom case, The

touch panel prepared in the above top case, the display panel of the PDP equipment formed in both the above-mentioned cases, and the circuit board of PDP equipment, Plasma display equipment characterized by having the PDP equipment side connector prepared in the skin of both the above-mentioned cases and a touch panel side connector, and the indicating lamp which approaches this touch panel side connector, is prepared, and displays the injection condition of the controller power source by the side of a touch panel.

[Claim 13] The upper case where the measures against EMI shielding were taken, respectively, and a bottom case, The power cable for a touch panel and touch panels prepared in the above top case, The **** seat for case immobilization which it was prepared in the corner of an above top case, and the clearance formed between upper cases was made to agree in the path of the above-mentioned power cable for touch panels, and served as the duty of a wiring clamp, Plasma display equipment characterized by having had **** for case immobilization which a point is thrust into this **** seat for case immobilization, and fixes both the above-mentioned cases, and having arranged the above-mentioned power cable for touch panels in the clearance between an above top case and the above-mentioned **** seat for case immobilization.

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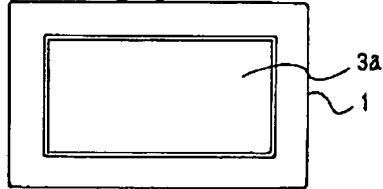
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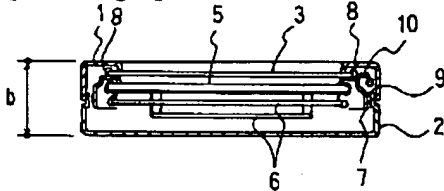
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DRAWINGS

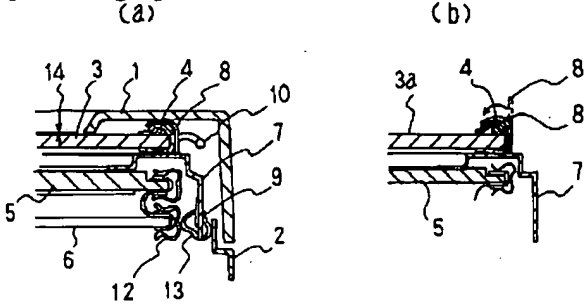
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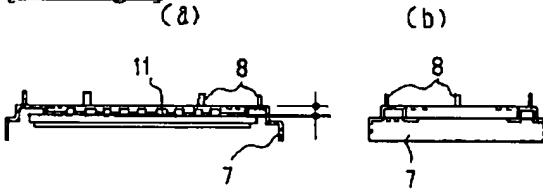
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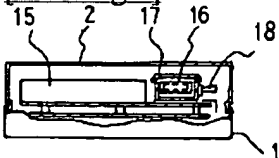
[Drawing 3]



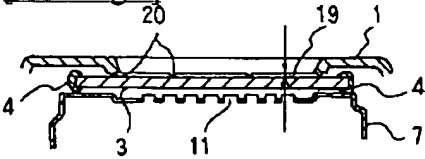
[Drawing 4]



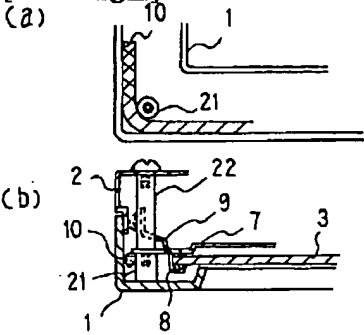
[Drawing 5]



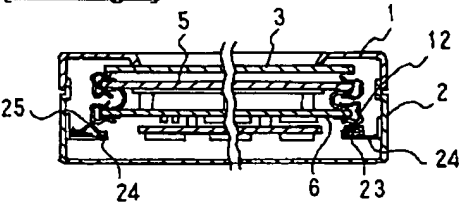
[Drawing 6]



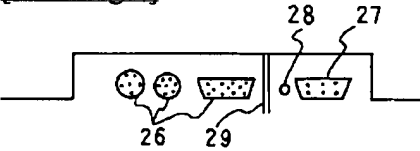
[Drawing 7]



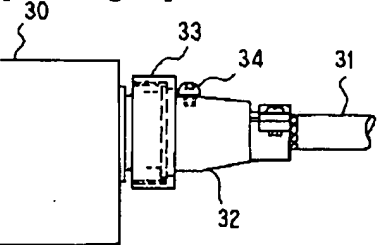
[Drawing 8]



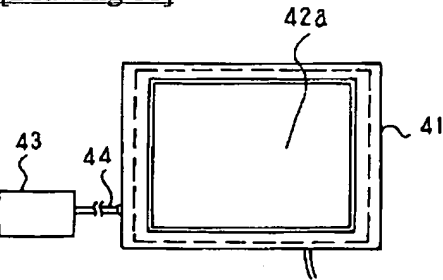
[Drawing 9]



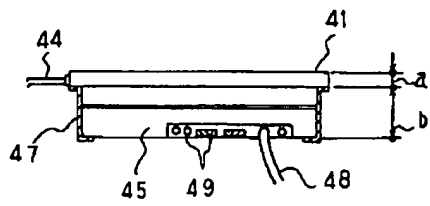
[Drawing 10]



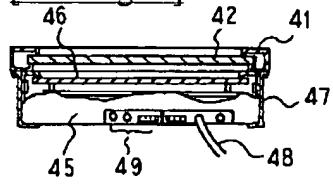
[Drawing 11]



[Drawing 12]



[Drawing 13]



[Translation done.]